

CLAIMS

1. An optical module wherein, in a package (12, 27, 33, 121) comprising a plurality of optical elements (3a and 3b) and an optical connector section (5, 32, 36, 121a, 121a) for connecting to an outside optical connector, tips of optical fibers (6, 24a, 24b, 62, 63, 124a, 124b) which are insertedly secured to said optical connector section, are aligned facing a light-emitting face and a light-receiving face of said optical elements,

the optical module (11, 30, 51, 120, 231) characterised in that said package has a positioning structure comprising walls and the like for directly contacting said optical elements, or mounts (4, 26a, 26b, 42, 43, 52, 28a, 28b, 128a, 128b) which the optical elements are mounted on, whereby this positioning structure ensures that said optical elements or the optical elements mounted on said mount are positioned in predetermined positions with respect to the tips of said optical fibers, which are insertedly secured to said optical connector and protrude to the inside of said package.

2. The optical module according to Claim 1, wherein a positioning stand (21, 27c, 37, 122) having positioning grooves (21a, 37a, 37b, 123a, 123b) for position-containing protrusions of said optical fibers, which are insertedly secured to said optical connector and protrude to the inside of said package, is molded together with said positioning structure.

3. The optical module according to Claim 1, wherein said optical connector section comprises a ferrule (5) provided separately to said package.

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4. The optical module according to Claim 1, wherein said positioning structure comprises protrusions for positioning (23, 24, 27a, 27b, 33a, 33h, 33k, 121e, 121f) which protrude inwardly from inner walls of the package.

5. The optical module according to Claim 2, wherein said positioning structure comprises a side face (33g, 121k) of said positioning stand provided so as to touch the side face of the mounts which the optical elements are mounted on and thereby position the mount.

6. The optical module according to Claim 1, wherein the optical elements are attached to one face of the mount, comprising electrodes which continue to an adjacent face, another face directly contacting a lead terminal (7, 8) of the package, and an electrode on said other face electrically connecting to the lead terminal.

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7. The optical module according to Claim 6, wherein the light-emitting element and the light-receiving element are attached to separate mounts, and the positions of these two mounts are deviated to the front and rear.

8. The optical module according to Claim 1, wherein optical fibers (124a, 124b) on said optical element side are provided in positioning grooves (123a, 123b), extending from the vicinity of said optical elements in the package (121) along a join end face (121d) of the package side wall section (121a) facing the optical connector (10b); positioned with respect to said optical elements by being pressed by a pressing member (125), thereby

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enabling them to be butt-connected to the optical fiber on said optical connector side at said join end face.

9. The optical module according to Claim 8, wherein said pressing member is positioned by inserting into a groove-like notch (121b) which passes through said package side wall.

10. The optical module according to Claim 8, wherein a meshing section (125b) meshes with the package around the installation position of the pressing member, thereby restricting positional deviation of said pressing member in the long direction of said positioning grooves.

11. The optical module (30) according to Claim 1, wherein fitting pin holes (34) which fitting pins for positioning (10a), provided so as to cross over to the optical connector (10), are inserted in, and optical fiber insertion holes (31) which optical fibers (24a, 24b) coupling to said optical elements are inserted in, are provided parallel to each other in the package side wall (32, 36).

12. The optical module according to Claim 11, wherein said optical fiber insertion holes comprise tapered optical fiber insertion openings (31b, 31c, 31d) at the ends of said package join end face (36a).

13. The optical module according to Claim 1, wherein said light-emitting element and light-receiving element are each sealed by a light-permeable material (63), and at least one

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of the light-emitting element and light-receiving element is further sealed by a light-absorbent material (64) provided outside said light-permeable material.

14. The optical module according to Claim 13, wherein said light-absorbent material comprises an organic polymeric material which absorbs scattered light from said light-emitting element.

15. An optical element attachment method for attaching said optical elements in the package in the optical module according to Claim 1; wherein the optical elements are attached to one face of the mount, comprising electrodes which continue to an adjacent face, another face directly contacting a lead terminal of the package, and an electrode on said other face electrically connecting to the lead terminal.

16. A receptacle-fitted optical module in which a receptacle (232, 250, 251), which an optical connector (213) is inserted in, and the optical module (231) according to Claim 1 are arranged facing each other, optical fibers of said optical connector being butt-aligned and optically connected to optical fibers of said optical module, wherein

protrusions (233) are provided in a side face, or a bottom face, of said optical module;

grooves (243) are provided in said receptacle for fitting said protrusions in;

said protrusions of the optical module are fitted into the grooves in said receptacle, and the optical module is secured to said receptacle by securing members (245, 253).

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17. The receptacle-fitted optical module according to Claim 16, wherein said securing member presses said optical module, and is secured to said receptacle via an adhesive (246).

18. The receptacle-fitted optical module according to Claim 16, wherein said securing member comprises a pressing member (253) having elasticity and being substantially C-shaped in cross-section; fitting concavities (252) for fitting the pressing member are provided in said receptacle, the pressing member is fitted into the fitting concavities, said optical module being pressed by the elasticity of said pressing member.

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